Great Salt Lake State Park and Marina

Hazard Mitigation Plan

2006

Prepared by the Utah Division of Emergency Services and Homeland Security

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INTRODUCTION

Great Salt Lake State and Marina is located on the south end of the Great Salt Lake, sixteen miles west of Salt Lake City off Exit 104 on Interstate 80. The park and park facilities have the potential to experience and be impacted from a natural hazard event.

This plan attempts to identify the hazards, understand what is vulnerable and develop solutions that can significantly reduce threat to life, property and economic stability of the Great Salt Lake State Park. An overview of natural hazards in the counties along the lake, and those hazards that affect these counties, was essential in the development of this plan.

Much of the information and development of mitigation strategies are from the Wasatch Front Regional Council 2004 Natural Hazard Mitigation Plan, 1983 and 1984 Hazard Mitigation Plans, and other source documents generated by Utah Department of Natural Resources, Water Resource Division and Utah Geological Survey. A countywide regional perspective was used in identifying and developing mitigation strategies. This gives the plan a broader sense of the hazards and more importantly the secondary impact from these hazards to the Great Salt Lake Park facilities.

This is not an emergency response or management plan. Certainly, the plan can be used to identify weaknesses and refocus emergency response planning. Enhanced emergency response planning is an important mitigation strategy. However, the focus of this plan is to support better decision making directed toward avoidance of future risks

and the implementation of activities or projects that will eliminate or reduce the risk for those that may already have exposure to a natural hazard threat.

STATEMENT OF RISK

The scope and purpose of this mitigation plan is to define and identifying natural hazards, which could affect the Great Salt Lake State Park. During the planning process earthquake, flood, drought, severe weather, and miscellaneous hazards we evaluated. The overall risk of property, lives, and the environment at Great Salt Lake State Park is dependent on the hazard.

WHAT IS HAZARD MITIGATION?

Hazard mitigation is defined as any cost-effective action(s) that has the effect of reducing, limiting, or preventing vulnerability of people, property, and the environment to potentially damaging, harmful, or costly hazards. Hazard mitigation measures, which can be used to eliminate or minimize the risk to life and property, fall into three categories. First: are those that keep the hazard away from people, property, and structures. Second: are those that keep people, property, and structures away from the hazard. Third: are those that do not address the hazard at all but rather reduce the impact of the hazard on the victims such as insurance. This mitigation plan has strategies that fall into all three categories.

Hazard mitigation measures must be practical, cost effective, and environmentally and politically acceptable. Actions taken to limit the vulnerability of society to hazards must not in themselves be more costly than the value of anticipated damages.

OVERVIEW

Great Salt Lake Park and Marina

Utah State Parks and Recreation opened this area as a park in 1975. In 1980, the marina was enlarged with new boat docks.

Between 1983 and 1987, the Great Salt Lake rose to 4211.5 feet above sea level causing severe damage to the Park's roads, parking areas, buildings and protective break walls. The marina was rebuilt in 1987 and reopened in September of that year.

Great Salt Lake State Park Facilities

The marina has slips available for year-round boating on the lake. Picnic area and a group pavilion are available as well as restrooms. The Park is also the home of the Great Salt Lake Yacht Club.

The Great Salt Lake

The Great Salt Lake is one of the most well known tourist destinations in Utah. The Great Salt Lake is a remnant of prehistoric Lake Bonneville, which covered an extensive area of the Great Basin. It is a shallow body of saltwater located between the Wasatch Range on the east and the Great Salt Lake Desert on the west. The lake varies greatly in size and depth according to climatic changes.

The Great Salt Lake's average depth ranges from 13 to 24 ft (4 to 7.3 m). From 1,000 sq mi (2,590 sq km) in the period between 1955 and 1975, the lake expanded to its modern maximum of almost 2,500 sq mi (6,477 sq km) by the mid-1980s. Storage of spring run-off in reservoirs to meet domestic and industrial demands for water contributes to seasonal lake level.

The lack of outflow contributes to the lake's salinity. While the ocean is 3.5 percent salt, Great Salt Lake's southern area is 15 percent salts. The north end, where the saline concentration is enhanced because the area is cut off by a railroad causeway, is 27 percent salt.

SALT LAKE COUNTY OVERVIEW

Salt Lake County is 764 square miles, 35 miles long, north to south (from Davis County to the Point of the Mountain), 35 miles wide, east to west (from the Wasatch Mountains to the Oquirrh Mountains) with 910,000 residents, and 15 municipalities.

The population of the County in 2000 was 898,387. It is expect to increase by 59.4% by 2030 to 1,431,843.

HAZARDS

FLOODING

Background

From 1963 through 1986, the Great Salt Lake rose nearly 20 feet, more than doubled its surface area, and increased its volume nearly three-fold. Almost 12 feet of the rise occurred during the flood years of 1982-1983. This significant rise was attributed to excessive precipitation in northern Utah drainage areas that feed the Great Salt Lake.

Flooding problems existed all around the lake. On the south shore, Interstate 80, the Union Pacific Railroad, the Great Salt Lake State Park and Marina, and beaches were inundated. The state park facilities access roads and marina were washed away; a remnant restroom building withstood the heavy waves the longest, but it too was pulled apart and spread along the shoreline.

By 1986 flood damage estimates around the lake to public and private land, industries, major transportation routes, public facilities and wildlife habitat totaled more than $240 million. Potential cost of damages was estimated at $1 billion, figuring affected company payrolls, tax payments, capital expenditures and purchases.

In response to the severe flooding, the state built pumps on the western side of the lake to pump high water out into the west desert, but as of 2006 these pumps are dry and miles away from the lake's shore. The pumps are maintained in the event the lake rises to those levels that would create serious flood threat.

Great Salt Lake State Park and Marina Flood Vulnerability Assessment

The rise of the Great Salt Lake during extreme wet years in now controlled by the west desert pumps. With this structural mitigation project in place and maintained, losses due to high lake levels should be minimal. It is important to note that high waves as a result of high water and wind can cause damage to buildings and the marina.

EARTHQUAKE

Background

In Utah, most earthquakes are associated with the Intermountain seismic belt an approximately 160-kilometer-wide (100 miles), north-south trending zone of earthquake activity that extends from northern Montana to northwestern Arizona. Since 1850, there have been at least 16 earthquakes of magnitude 6.0 or greater within this belt. Most areas of the state within the Intermountain seismic belt, including southwestern Utah, have experienced large surface-faulting earthquakes in the recent geologic past. The Wasatch Fault Zone is located in Salt Lake County.

Great Salt Lake State Park and Marina Earthquake Vulnerability Assessment

A significant earthquake in the Salt Lake Valley could cause some damage to the park. Ground shaking and liquefaction would increase the risk of damage to buildings and roads.

Additionally, economic systems are such that a large magnitude earthquake on the Wasatch Fault would have considerable financial impact to the Great Salt Lake State Park and Marina. Repairing earthquake damage reduces financial resources often lessening the amount spent on recreation.

SEVERE WEATHER

Background

Severe thunderstorms during the summer months or severe storms at any time of the year that produce high winds can be a serious threat to life and property.

Lightning and strong winds can be a serious threat to life and property. According to the National Oceanic and Atmospheric Administration (NOAA), there have been 53 reported deaths and 132 reported injuries from lightning in Utah between 1950 and 200 even with a protective break wall/levee around the marina, high winds have damaged the docks and boats docked in the marina.

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Great Salt Lake Park and Marina Severe Weather Vulnerability Assessment

Extreme heat and thunderstorms that include lightning, cloudbursts and hail have the potential to impact park facilities and park visitors. The highest winds from thunderstorms are those usually associated with lines of thunderstorms. These large thunderstorms occasionally produce strong downdraft winds. Strong winds associate with a storm front any time of the year can cause damage.

Severe weather events such as hail, lightning and cloudburst and could damage park buildings and the marina docks. Park visitors and park staffs are also in danger during summer lightning and thunderstorms. Sailing enthusiast at any time of the year can find themselves in perilous conditions during extreme weather events whether on the lake on docked in the marina. NOAA weather monitoring sites near the lake allow of real time data to better evaluate the risk from winds and other weather related extremes.

DROUGHT

Background

Precipitation fluctuates greatly in Utah's relatively arid climate. As the demand for water continues to increase, even temporary shortages in supply can be disruptive to the normal process in urban and rural environments. Two or more consecutive years of significant reduction in precipitation, particularly snowfall in the mountains, may have serious and far-reaching impacts.

Great Salt Lake Park and Marina Drought Vulnerability Assessment

The park serves as an important recreational opportunity for visitors interested in sailing and enjoying the wildlife and panoramic views of the lake. Lower water levels will affect access to the lake and the recreational water activities tied to the lake such as sailing and kayaking and the secondary services in support of these activities.

Great Salt Lake State Park and Marina Hazard Mitigation Recommendations

RECOMMENDATION: Minimize potential impacts from flooding as lake levels increase.

1. State Parks and Recreation should work closely with State Water Resources in monitoring the level of the lake. State Water Resources in responsible for maintenance of the west desert pumps.

2. When the lake level increases, support awareness of increased risk and safe water sport recreational activities through public outreach and additional signage.

RECOMMENDATION: Minimize the potential impacts from severe weather.

1. Monitor weather and disseminate critical weather situations to park visitors especially during summer thunderstorm season. NOAA Weather Radios as well as access to Salt Lake National Weather Service web site can assist in this process.

RECOMMENDATION: Minimize potential impacts from drought.

1. Although mitigating a drought is impossible, it will be helpful to monitor drought conditions and drought response activities through Department of Natural Resources, Water Resources.

RECOMMENDATION: Minimize potential impacts from earthquakes.

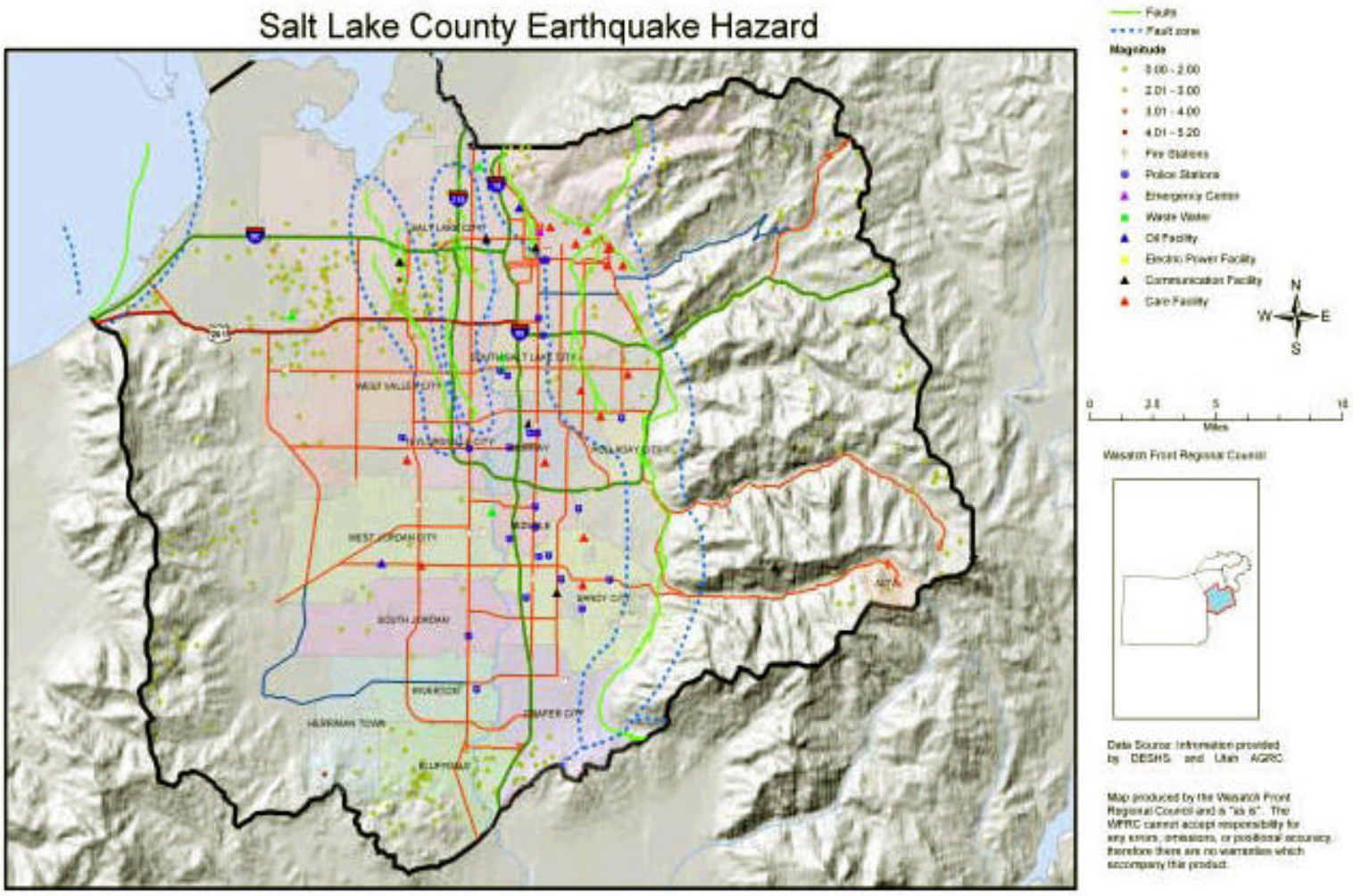
1. Ensure fuel storage tanks in the marina are tied down as well as any other portable facility used for concessions or information.

2. Ensure non-structural mitigation, such as tie-downs for computer equipment, braces and secure attachments for bookcases, is include as a mitigation measure.

3. Ensure park staff is prepared for the effects following an earthquake and have adequate emergency response plans. 72 hours kits should be on site and accessible.

4. With a high potential to experience the effects from liquefaction, develop alternate routes in and out of the park.

5. Primary and alternate communications systems should be in place and tested between Salt Lake County Emergency Services, Department of Natural Resources and park employees to coordinate a response following an earthquake.


Salt Lake County Earthquake Hazard
Faults
Fault zone
Magnitude
0.00 - 2.00
2.01 - 3.00
3.01 - 4.00
4.01 - 5.20
Fire Stations
Police Stations
Emergency Center
Waste Water
Oil Facility
Electric Power Facility
Communication Facility
Care Facility
N
W
E
S
0
2.5
5
10
Miles
Wasatch Front Regional Council
Data Source: Information provided by DEM/HS and Utah AGRC.
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Salt Lake County Liquefaction Potential